User manual

JBUS/BMS INTERFACE - ECOLEAN

• • • Providing indoor climate comfort

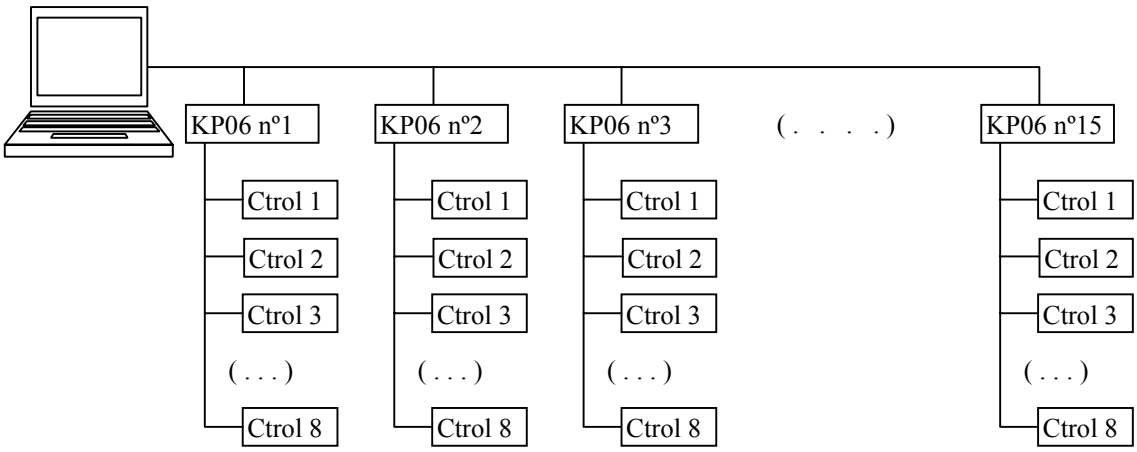
MUL33E-0904 12-2009
Original manual translation

TECHNICAL DATA

USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

1.- ¿How is the net configured? (How many units can be connected, which are the combination, what is needed by the interface?)

The purpose of this net is connecting one or more units Ecolean to a BMS system. To get this we use the interface KP06. Up to 8 units can be connected (depending sizes and characteristics), to an interface KP06. We can connect up to 15 KP06 to the net.



In each Ecolean unit, is necessary to install a BUS adapter to convert the control (TTL) system in a signal RS-485.

We can connect in the net different controllers (as Climatic, Ecolean), but in a KP06 we can connect only controllers of the same type.

2. - ¿What can be controlled by this net?

With this system, we can manage the following options in each of Ecolean units:

- Select between OFF/STAND-BY/COOL/HEAT.
- Modify the cooling / heating setpoint
- Read the limitations in the unit, as the functioning of the heat pump, the maximum setpoint, and minimum setpoint. .
- Read all the alarm status.
- Read inlet water temperature , outlet water temperature, condensing temperature and outdoor temperature (this last one only if the unit is fitted with the dynamic setpoint option)
- Read inlet signals status (pressostats, water flow switch, thermal relays motor protections).
- Read the outlet signal status (compressor, fan, water pump ...).

3. - Fitting instructions.

It is necessary to include in every installation:

One Bus Adapter by each of the units
One KP06 at least by every 8 units

Bus Adapter will be delivered installed inside the Ecolean unit (electrical board), with the power supply taken from the general power supply of the unit, and the control connection made. KP06 is delivered loose, for later installation in the most adequate place.

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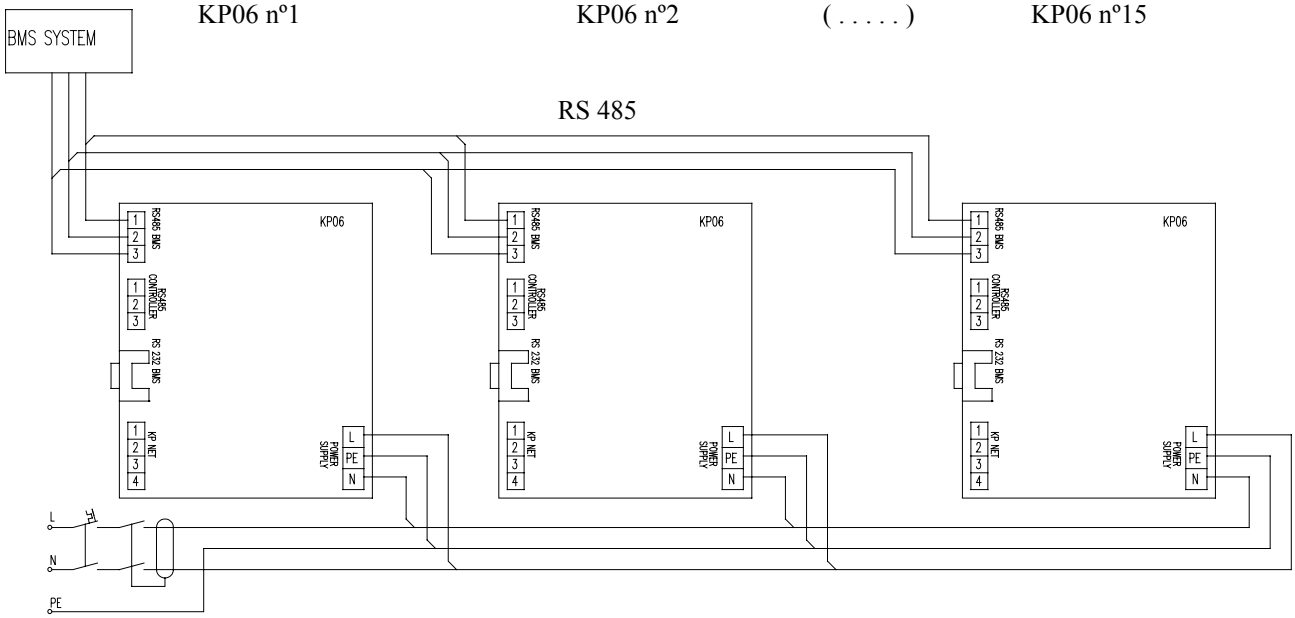
USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

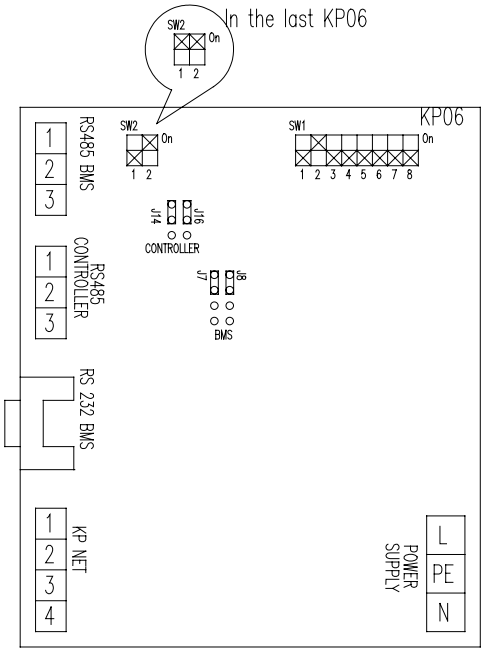
4. - Connections

This sample could be the Standard connection of a KP06 net with a BMS system with a RS485 connection. It is also possible to connect with a BMS net or a computer provided with a RS232 connection, but in this case there can be only one KP06 and the connection cannot be longer than 15 meters (see KP06 details for further details)

Connections between KP06



KP06 configuration



- Connection between the BMS system and the KP06 must be done according the figure besides, taking into account the following indications :
  - The wiring has to be done according local normatives.
  - Every KP06 have to be supplied with 230 Vac/50 Hz + PE (15%). Use a cable with a 1.5 mm2 section.
  - Maximum length of the RS485 net (from the BMS system to the last) is 1.000 m.
  - BMS connection is RS 485. It has to be connected to the port RS 485 of BMS with every KP06 in parallel.
  - It is advisable to use screened cable with a 0.5 mm^2 for this type of connection.
- Jumpers J8 y J9 of the connected KP06 to the Ecolean units should be connected in 1-2 position.
- Switch SW2-1 of every KP06 should be in ON-OFF position, except the last one that has to be in ON position.
- Switches SW1-7 y 8 is used to configurate the transmission speed according the following table.

Bauds	1200	2400	4800	9600
SW1-7	ON	ON	OFF	OFF
SW1-8	ON	OFF	ON	OFF

Configurate the other switches SW1 as the figure resides.

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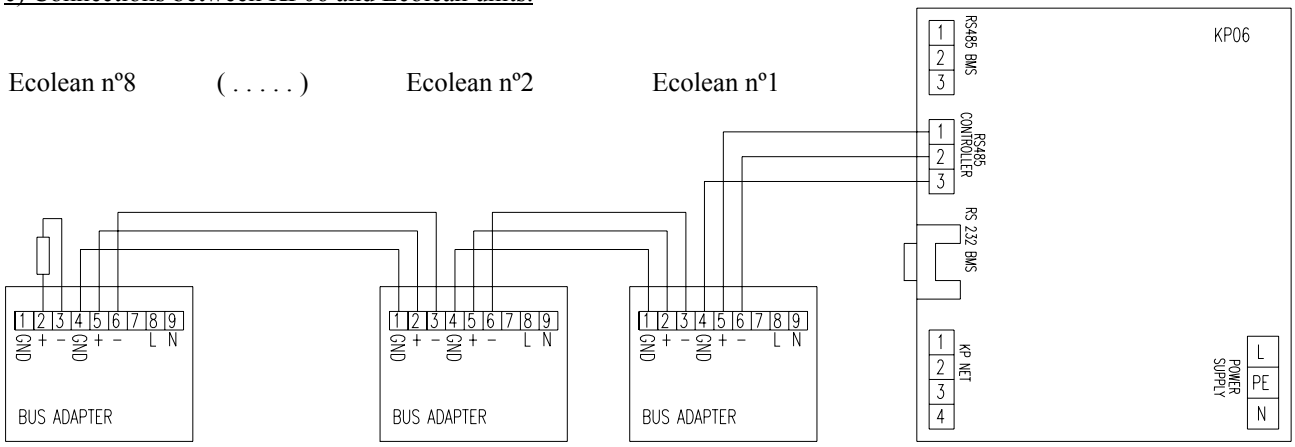
USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

c) Connections between KP06 and Ecolean units.



- In every Ecolean unit there is a Bus Adapter. In this Bus Adapter a power supply connection has been done, as well as the control connection in the Ecolean unit.
- Connection between KP06 and the Ecolean unit , has to be done as shows the figure taking into account the following indications:
  - Maximum length for the RS485 net (from the KP06 to the last ECOLEAN unit) is 2000 m.
  - Wiring has to be done according the local normatives.
  - Screened cable of 0.5 mm2 is advisable.
    (for example cable model Belden 8762 with PVC isolation , cable plus metallic screen , 20 AWG, nominal capacity between cables of 89 pF, nominal capacity between a cable and the metallic screen of 161 pF)..
  - Use the cables to connect + and - and the screen to connect GND.
  - In each Bus Adapter of the last Ecolean, connect a 120 ohms resistance 1/4w between + and - .
- Each Ecolean unit connected to a KP06 has a different address between 1 and 8 .This address is introduced in the controller.

  Climatic 200
  Units EAC 0091 to EAC 0812 and EAR 0091 to 0431
  Parameter H26 protocol 1
  Parameter H44 family address 0
  Parameter H45 device address 1.8

  Climatic 400
  Units EAC 1003 to EAC 1303 and EAR 0472 to EAR 1303
  Parameter H48 protocol 1
  Parameter H65 family address 0
  Parameter H66 device address 1.8.
- It is necessary configurate the KP06 to the RS485 net (jumpers J14 and J16 in 1-2 position)

TECHNICAL DATA

USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

5.-Parameters

5. a Climatic 200

This controller is installed in EAC 0091 to EAC 0812 and EAR 0091 to 0431. This controller has the following map of standard parameters.

/CHART 1/
/Logical parameters/
/Analogical parameters/

00H	2049	M/Pa_G01	G01-Cooling setpoint	L/E
01H	2050	M/Pa_G02	G02-Heating setpoint	L/E
02H	16468	M/MachineStatus	Machine_Status	L/E
80H	2052	Pa_H01	H01-Max setpoint in heating	L
81H	2053	Pa_H02	H02-Min setpoint in heating	L
82H	2054	Pa_H03	H03-Max setpoint in cooling	L
83H	2055	Pa_H04	H04-Min setpoint in cooling	L
84H	2079	Pa_H28	H28-HeatPump selecction	L
85H	16415	ST1_MSB	Inlet Temp : MSB	L
86H	16416	ST1_LSB	Inlet Temp : LSB	L
87H	16417	ST2_MSB	Oulet Temp : MSB	L
88H	16418	ST2_LSB	Outlet Temp : LSB	L
89H	16419	ST3_MSB	Piping : MSB	L
8AH	16420	ST3_LSB	Piping : LSB	L
8BH	16421	ST4_MSB	Outdoor temp : MSB	L
8CH	16422	ST4_LSB	Outdoor temp : LSB	L
8DH	16483	Ana_Output	Analog Output	L
8EH	16404	Digit_Input	Digit_Input	L
8FH	16469	Digit_Output	Digital Output	L
90H	16492	Alarm_Auto_1	Alarm_Auto_1	L
91H	16493	Alarm_Auto_2	Alarm_Auto_2	L
92H	16494	Alarm_Auto_3	Alarm_Auto_3	L
93H	16495	Alarm_Manu_1	Alarm_Manu_1	L
94H	16496	Alarm_Manu_2	Alarm_Manu_2	L
95H	16497	Alarm_Manu_3	Alarm_Manu_3	L
96H	18433	Version	VERSION	L

5.b Detailed information about CLIMATIC 200 parameters

00H, 01H parameters (readable and writable)

This parameter defines the setpoint which the unit will function with , in cooling mode (parameter 00 H) or heating mode (01H) .

¡Important : The value of the desired temperature has to be multiplied by 10!

Introduced values for this parameter have to be within the range between minimum setpoint (Parameter 82 H cooling / 80 H heating) and the maximum setpoint (Parameter 83 H cooling / 81 H heating) .

¡Important: if the unit Works out of this range of temperatures , unit can work suffering critical damages !

If the unit is cooling only , there is no sense in using 01H parameter . This possibility can be restrained with the parameter 84 H , which shows with the value 1 if the unit is heat pump version .

Example : H00=110 and H01=430 shows the cooling setpoint 11.0ºC and the heating setpoint 43.0ºC

02H parameter (readable and writable)

This parameter defines the functioning of the unit according the following :

Parameter 02H=00H ∧ Stopped unit
Parameter 02H=04H ∧ Stand- By mode
Parameter 02H=05H ∧ Cooling only mode
Parameter 02H=06H ∧ Heating pump mode

¡Important. If values different from 0 are used, they may appear wrong values!

To know if the unit can work as a heat pump , parameter 84 H has to be read.

¡Important : if in a cooling only unit , heat pump mode is demanded , unit can work suffering critical damages!

80H, 81H, 82H, 83H parameters (only readable)

Limits of cooling setpoint and heating setpoint:

80H ∧ Maximum heating setpoint
81H ∧ Minimum heating setpoint
82H ∧ Maximum cooling setpoint
83H ∧ Minimum cooling setpoint

Use these values to establish the limits values for the parameters 00H y 01H.

84H (only readable)

Shows a 0 value if the unit is cooling only , and a 1 value if the unit is heat pump .

Use these value to establish if it is posible to modif. The heating setpoint (H01 parameter) and it is more important to know if it can be switched in heat pump mode (H02 parameter)

85H, 86H, 87H, 88H, 89H, 8AH, 8BH, 8CH parameters (only readable)

In this parameters we can read the values measured by different temperature sensors of the unit.

85H ∧ Water inlet temperature (MSB)
86H ∧ Water inlet temperature (LSB)
87H ∧ Water outlet temperature (MSB)
88H ∧ Water outlet temperature (LSB)
89H ∧ Refrigerant piping temperature (MSB)
8AH ∧ Refrigerant piping temperature (LSB)
8BH ∧ Outdoor temperature (MSB)
8CH ∧ Outdoor temperature (LSB)

Nota: The outdoor temperature will only show the correct values if the outdoor temperature sensor is included. (dynamic setpoint kit)

To calculate the value , we have to take into account the following value:

ºC·10= MSB·256 + LSB

*Example : in 85H we can read value 1 and in 86H value 172. This means 1 * 256 + 172=428. The water indoor temperature sensor is showing a value of 42.8ºC.*

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USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

8DH, 8EH, 8FH Parameters (only readable)

In these parameters we can read the status of the different devices of the unit.

8DH ∧ Analogical outputs (% fan speed)
8EH ∧ Digital inputs (pressostats, protections, remote on/off , remote cooling /heating)
8FH ∧ Digital outputs (compressor , water pump, 4 way valve , antifreeze heater , alarm relay)

The correspondance with the different devices is as following :

In 8DH parameter fan speed (in %) is shown .
0: fan stopped
100: maximum fan speed,
Intermediate values: fan in regulation
In FP2 version , this parameter only take values 0 and 10

Parameter 8EH shows the different digital inputs according the models as shown in the table below. (1 means closed contact and 0 means open contact) .

EAC 0091 to 0431

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
Low pressure switch	High pressure switch	Remote ON/OFF	Compressor protection	Flor switch	Not used	Not used	Not used

EAR 0091 to 0431

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
Low pressure switch	High pressure switch	Remote ON/OFF	Compressor protection	Flow switch	Not used	Not used	Remote cooling /heating

EAC 0472 a 0812

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
Low pressure switch	High pressure switch	Remote ON/OFF	Compressor 1 protection	Flow switch	Not used	Not used	Compressor protection 2

Example : in one unit EAC 0431 the value of 208 (1101 0000 in binary system) shows that the compressor protection , the high pressure switch , and the low pressure switch are closed and that the remote ON/OFF plus the flow switch are opened.

With 8FH parameter we can see the functioning of the different components according models as shown in the following table. (1 means functioning , 0 means stop, except the alarm relay that shows 1 when stopped or absence of alarm and shows 1 when the unit is functioning or there is an alarm)

EAC 0091 to 0431

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
Not used	Not used	Not used	Alarm relay	Antifreeze heater	Not used	Water pump	Compressor

EAR 0091 to 0431

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
Not used	Not used	Not used	Alarm relay	Antifreeze heater	4 way valve	Water pump	Compressor

EAC 0472 to 0812

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
Not used	Not used	Not used	Alarm relay	Antifreeze heater	Compressor 2	Water pump	Compressor 1

Example : in a EAC 0431 unit , the value of 19 (0001 00 11 in binary system) shows that the compressor and the pump are working , there is not alarm and the antifreeze heater is in off position.

TECHNICAL DATA

USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

90H, 91H, 92H, 93H, 94H, 95H parameters (only readable)

In these parameters the presence of an alarm is shown, and if it necessary , it can be restarted. 90H, 91H and 92H parameters, show the alarm status ,and 93H, 94H and 95H show the necessity of restarting .

Alarm 90H restart 93H

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
E11	E43	E05	E04	E41	E02	E01	E00

Alarm 91H restart 94H

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
E46	E42	E07	E06	E40	E45	E44	E12

Alarm 92H restart 95H

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
Not used	Not used	Not used	Not used	Not used	Not used	E13	E03

The meaning of these different alarm codes is the following :

- E00 ∧ remote ON/OFF
- E01 ∧ High pressure
- E02 ∧ Low pressure
- E03 ∧ Compressor overload relay
- E04 ∧ Fan overload relay
- E05 ∧ Antifreeze
- E06 ∧ Error in outlet water sensor
- E07 ∧ Error in refrigerant piping sensor
- E11 ∧ Piping high temperature
- E12 ∧ Piping low temperature
- E40 ∧ Error in inlet water sensor
- E41 ∧ Error in flow switch sensor
- E42 ∧ Error in outdoor temperature sensor
- E43 ∧ External antifreeze
- E44 ∧ Unit without charge
- E45 ∧ Configuration error
- E46 ∧ High inlet water temperature

Some of these alarms may be not activated in your unit, or have slightly different meanings. In the unit manual you will see the meaning of every of these alarms.

Example : if a high pressure alarm appears , 90H and 93H values will take then value 2 (0000 0000 in binary system) , when the cause of the alarm is eliminated , (restarting of the pressostat) , in 90H we will have then value 0 (0000 0000 in binary system) , but in 93H the value won´t change until we restart the alarm in the controller (pressing reset button) .

96H parameter (readable only)

This parameter shows the current version of the control software.

5.c Standard Climatic 400 Chart

/CHART 1/
/Logical parameters/

80H	8193	I/ID1	Digital input I/ID1:	L
81H	8194	I/ID2	Digital input I/ID2:	L
82H	8195	I/ID3	Digital input I/ID3:	L
83H	8196	I/ID4	Digital input I/ID4:	L
84H	8197	I/ID5	Digital input I/ID5:	L
85H	8198	I/ID6	Digital input I/ID6:	L
86H	8199	I/ID7	Digital input I/ID7:	L
87H	8200	I/ID8	Digital input I/ID8:	L
88H	8201	I/ID9	Digital input I/ID9:	L
89H	8202	I/ID10	Digital input I/ID10:	L
8AH	8203	I/ID11	Digital input I/ID11:	L
8BH	8204	I/ID12	Digital input I/ID12:	L
8CH	8205	I/ID13	Digital input I/ID13:	L
8DH	8206	I/ID14	Digital input I/ID14:	L
8EH	8207	I/ID15	Digital input I/ID15:	L
8FH	8208	I/IDST4	Digital input ST4:	L
90H	10241	RL1	Relay1 -	L
91H	10242	RL2	Relay2 -	L
92H	10243	RL3	Relay3 -	L
93H	10244	RL4	Relay4 -	L
94H	10245	RL5	Relay5 -	L
95H	10246	RL6	Relay6 -	L
96H	10247	RL7	Relay7 -	L
97H	10248	RL8	Relay8 -	L
98H	10249	RL9	Relay9 -	L
99H	10250	RL10	Relay10 -	L

/Analogic parameters/

00H	2049	M/Pa_G01	G01-Cooling setpoint	L/E
01H	2050	M/Pa_G02	G02-Heating setpoint	L/E
02H	16495	M/MachineStatus	Machine_Status	L/E
80H	2051	Pa_H01	H01-Max setpoint in heating	L
81H	2052	Pa_H02	H02-Min setpoint in heating	L
82H	2053	Pa_H03	H03-Max setpoint in cooling	L
83H	2054	Pa_H04	H04-Min setpoint in cooling	L
84H	2060	Pa_H10	H10-HeatPump selecction	L
85H	4097	I/ST1	Inlet temp	L
86H	4098	I/ST2	Outlet Temp	L
87H	4099	I/ST3	Piping circuit 1	L
88H	4100	I/ST4	Outdoor temp	L
89H	4102	I/ST6	Piping circuit 2	L
8AH	16497	Hour_funct,[1]MSB	Hours funct. Compresseur 1 x 256 h	L
8BH	16498	Hour_funct,[1]LSB	Hours funct. Compresseur 1 x 1h	L
8CH	16499	Hour_funct,[2]MSB	Hours funct. Compresseur 2 x 256 h	L
8DH	16500	Hour_funct,[2]LSB	Hours funct. Compresseur 2 x 1h	L
8EH	16501	Hour_funct,[3]MSB	Hours funct. Compresseur 3 x 256 h	L
8FH	16502	Hour_funct,[3]LSB	Hours funct. Compresseur 3 x 1h	L
90H	16503	Hour_funct,[4]MSB	Hours funct. Compresseur 4 x 256 h	L
91H	16504	Hour_funct,[4]LSB	Hours funct. Compresseur 4 x 1h	L
92H	16505	Hour_funct,[PUMP]MSB	Hours funct. Pump x 256 h	L
93H	16506	Hour_funct,[PUMP]LSB	Hours funct. Pump x 1h	L
94H	14337	Ana_Output_1	Analog Output 1	L
95H	14338	Ana_Output_2	Analog Output 2	L
96H	16473	Digit_Input_MSB	Digit_Input	L
97H	16474	Digit_Input_LSB	Digit_Input	L
98H	16731	Digit_Output_MSB	Digital Output	L

99H	16732	Digit_Output_LSB	Digital Output	L
9AH	16879	Alarm_Auto_1	Alarm_Auto_1	L
9BH	16880	Alarm_Auto_2	Alarm_Auto_2	L
9CH	16881	Alarm_Auto_3	Alarm_Auto_3	L
9DH	16882	Alarm_Auto_4	Alarm_Auto_4	L
9EH	16883	Alarm_Manu_1	Alarm_Manu_1	L
9FH	16884	Alarm_Manu_2	Alarm_Manu_2	L
A0H	16885	Alarm_Manu_3	Alarm_Manu_3	L
A1H	16886	Alarm_Manu_4	Alarm_Manu_4	L
A2H	18433	I/Ver	VERSION	L

5.d Detailed explanation of the CLIMATIC 400 parameters

5.d.1 /Logical parameters

In the zone of logical parameters , we can read the different status of the controller digital outlets and inlets . Correspondence between these inlets , depending the model of unit are the following :

EAR 0472 to 0812

80H	*81H*	*82H*	*83H*	*84H*	*85H*	*86H*	*87H*
High pressure switch 1	Low pressure switch 1	Fan + compressor protection 1	Defrosting switch 1	Flow switch	High pressure switch 2	Low pressure switch 2	Fan+ compressor protection 2
88H	*89H*	*8AH*	*8BH*	*8CH*	*8DH*	*8EH*	*8FH*
Defrosting switch 2	Remote on/off	Remote cooling / heating	Not used	Not used	Not used	Not used	Not used
90H	*91H*	*92AH*	*92H*	*94H*	*95H*	*96H*	*97H*
Compressor 1	4 way valve 1	Compressor 2	4 way valve 2	Water pump	Electrical heater	Electrical heater	Alarm
98H	*99H*						
Not used	Not used						

EAC 1003 to 1303

80H	*81H*	*82H*	*83H*	*84H*	*85H*	*86H*	*87H*
High pressure switch	Low pressure switch 1	Fan protection 1	Defrosting pressostat 1	Flow switch	High pressure switch 2	Low pressure switch 2	Fan protection 2
88H	*89H*	*8AH*	*8BH*	*8CH*	*8DH*	*8EH*	*8FH*
Defrosting pressostat 2	Remote ON/OFF	Remote cooling /heating	Compressor protection 1	Compressor protection 2	Compressor protection 3	Compressor protection 4	Not used
0H	*91H*	*92AH*	*92H*	*94H*	*95H*	*96H*	*97H*
Compressor 1	Fan 1	Compressor 2	Fan 2	Water pump	Electrical heater	Electrical heater	Alarm
98H	*99H*						
Compressor 3	Compressor 4						

EAR 1003 to 1303

80H	*81H*	*82H*	*83H*	*84H*	*85H*	*86H*	*87H*
High pressure switch 1	Low pressure switch 1	Fan+ compressor protection 1	Defrosting pressostat 1	Flow switch	High pressure switch	Low pressure switch 2	Fan +compressor protection
88H	*89H*	*8AH*	*8BH*	*8CH*	*8DH*	*8EH*	*8FH*
Defrosting switch 2	Remote ON/OFF	Remote cooling/ heating	Compressor protection 1	Compressor protection 2	Compressor protection 3	Compressor protection 4	Not used
90H	*91H*	*92AH*	*92H*	*94H*	*95H*	*96H*	*97H*
Compressor 1	4 way valve 1	Compressor 2	4 way valve 2	Water pump	Electrical heater	Electrical heater	Alarm
98H	*99H*						
Compressor 3	Compressor 4						

5.d.2 /Analogical parameters/

00H, 01H (readable and writable)

This parameter defines the setpoint which the unit will function with in cooling (00H parameter) or in heating (01H parameter)

¡Important: Value of the required temperature has to be multiplied by 10!

Values included in this parameter must be within the range from the minimum setpoint (82H parameter for cooling / 80H for heating) and the maximum setpoint (Parameter 83H for cooling / 81 H for heating) .

¡Important: if the unit Works out of this range of temperatures, the unit may work with critical damages!

If the unit is a cooling only unit , there is not sense in using 01H parameter. We can limit this possibility with the 84 H parameter which with the value 1 shows that the unit is heating pump version .

Example: H00=110 and H01=430 shows cooling setpoint 11.0ºC and heating setpoint 43.0ºC

02H parameter (readable and writable)

This parameter defines the function of the unit as following :

Parameter 02H=00H ∧ Stopped unit
Parameter 02H=80H ∧ Stand-By mode
Parameter 02H=81H ∧ Cooling only mode
Parameter 02H=82H ∧ Heat pump mode

¡Important: If different values are used , the result obtained maybe wrong!

To know if the unit can work in heat pump mode , read the value of the 84 H parameter.

¡Important: If in a cooling only unit , heat pump mode is demanded , the unit may work with critical damages!

80H, 81H, 82H, 83H parameters(only readable)

Cooling and heating setpoint limits, in detail :

80H ∧ Maximum heating setpoint
81H ∧ Minimum heating setpoint
82H ∧ Maximum cooling setpoint
83H ∧ Minimum cooling setpoint

Use these values to establish the limit values of the parameters 00 H and 01 H.

84H (only readable)

Shows with a value 0 if the unit is cooling only or with a value 1 if the unit is heat pump mode.

Using this value can establish if it is possible to modify the heating setpoint (H01 parameter) and more important also if we can change to heat pump mode (H02 parameter)

85H, 86H, 87H, 88H, 89H parameters (only readable)

In these parameters we can read the values measured by the temperature sensors in the unit. The values shown are ºC x 10.

85H ∧ Outlet water temperature
86H ∧ Outlet water temperature
87H ∧ Refrigerant piping temperature 1
88H ∧ Outdoor temperature
89H ∧ Outdoor temperature circuit 2

Note: Outdoor temperature will only show correct values if the unit is fitted with the outdoor temperature sensor (dynamic setpoint kit)

Example: in 85H we will read the value 428, so the inlet water sensor is showing the value 42.8ºC.

8AH, 8BH, 8CH, 8DH, 8EH, 8FH, 90H, 91H, 92H, 93H parameters (only readable)

In these parameters we can read the hours of functioning of different components, in detail:

8AH ∧ Hours of functioning of compressor 1 (MSB)
8BH ∧ Hours of functioning of compressor 1 (LSB)
8CH ∧ Hours of functioning of compressor 2 (MSB)
8DH ∧ Hours of functioning of compressor 2 (LSB)
8EH ∧ Hours of functioning of compressor 3 (MSB)
8FH ∧ Hours of functioning of compressor 3 (LSB)
90H ∧ Hours of functioning of compressor 4 (MSB)
91H ∧ Hours of functioning of compressor 4 (LSB)
92H ∧ Hours of functioning of water pump (MSB)
93H ∧ Hours of functioning of water pump (LSB)

To calculate the value, the following formula has to be taken into account:

$$HR = MSB \cdot 256 + LSB$$

*Example: in 8AH we can read the value 2 and in 8 BH a value of 48. This means 2 * 256 + 48=560. This shows that compressor 1 has worked 560 hours.*

94H, 95H, 95H, 96H, 97H, 98H, 99H parameters (only readable)

In these parameters we can read the status of the different devices of the unit:

94H, 95H ∧ Analogical outputs (% fan speed)
96H, 97H ∧ Digital inputs (pressostats, protections, remote on/ off, remote cooling/ heating)
98H, 99H ∧ Digital outputs (compressor, water pump, 4 way valve, antifreeze heater, alarm relay)

Correspondence with the different devices is the following:

94H and 95H parameters show the speed (in %) of fans 1 and 2 :
0: fan stopped
100: maximum fan speed
Intermediate values: fan in regulation
This value is valid for:
- EAR 0472 to 0812 standard and FP1.
- EAR 1003 to 1303 but only taking 0 and 100 values.

TECHNICAL DATA

USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

96H y 97H parameters show the different digital inlets, according the models as following (1 means closed contact and 0 open contact)

EAR 0472 to 0812

	Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
96H	Not used	Not used	High pressure switch 1	Low pressure switch 1	Fan + comp protection 1	Not used	Not used	Remote cooling / heating
97H	Defrosting switch 2	Fan + compressor 2 protection	Remote ON/OFF	Not used	Low pressure switch 2	Flow switch	Defrosting switch	High pressure switch 2

EAC 1003 to 1303

	Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
96H	Compressor protection 4	Compressor protection 3	High pressure switch 1	Low pressure switch 1	Fan protection 1	Not used	Compressor protection 2	Not used
97H	Not used	Fan protection 2	Remote on/off	Compressor protection 1	Low pressure switch 2	Flow switch	Not used	High pressure switch 2

EAR 1003 to 1303

	Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
96H	Compressor protection 4	Compressor protection 3	High pressure switch 1	Low pressure switch 1	Fan protection 1	Not used	Compressor protection 1	Not used
97H	Defrosting pressostat 2	Fan protection 2	Remote ON/OFF	Compressor protection 2	Low pressure switch 2	Flow switch	Defrost swicth 1	High pressure switch 2

Example : in a unit EAC 1103 the value of 96H is 208 (1111 1010 in binary) shows that the protections of the compressors 4,3 and 2 , the protection of the fan 1 , the high pressure switch 1 and the low pressure switch 1 are closed.

98H y 99H will show the functioning of the following devices, according the models (1 means functioning, 0 means stop)

EAR 0472 to 0812

	Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
98H	Electrical heater	Electrical heater	Water pump	4 way valve 2	Compressor 2	4 way valve 1	Compressor 1	Alarm
99H	Fan 1 (only FP2 version)	Fan 2 (only FP2 version)	Not used	Not used	Not used	Not used	Not used	Not used

EAC 1003 to 1303

	Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
98H	Electrical heater	Electrical heater	Water pump	Fan 2	Compresso 2	Fan 1	Compressor 1	Alarm
99H	Compressor 3	Compressor 4	Not used	Not used	Not used	Not used	Not used	Not used

EAR 1003 to 1303

	Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
98H	Electrical heater	Electrical heater	Water pump	4 way valve 2	Compressor 2	4 way valve 1	Compressor 1	Alarm
99H	Compresor 3	Compresor 4	N/U	N/U	N/U	N/U	N/U	N/U

Example : in one unit EAC 0472 the value of 34 (0010 0010 in binary) show that there are only functioning compressor 1 and water pump .

TECHNICAL DATA

USING OF THE INTERFACE KP06 FOR ECOLEAN UNITS

9AH, 9BH, 9CH, 9DH, 9EH, 9FH, A0H, A1H parameters (only readable)

In these parameters it is shown the presence of an alarm , and if it is neccessary the restarting. 90H, 91H and 92H parameters shown the status of the alarm and 93H, 94H and 95H the necessity of restarting .

Alarm 9AH restart 9EH

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
E07	E06	E05	E04	E03	E02	E01	E00

Alarm 9BH restart 9FH

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
E23	E22	E21	E19	E13	E12	E11	E09

Alarm 9CH restart A0H

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
E33	E32	E31	E29	E27	E26	E25	E24

Alarm 9DH restart A1H

Bit 7	*Bit 6*	*Bit 5*	*Bit 4*	*Bit 3*	*Bit 2*	*Bit 1*	*Bit 0*
E46	E45	E44	E43	E42	E41	E40	E39

The meaning of the alarms is the following:

- E00 ∧ remote ON/ OFF
- E01 ∧ High pressure circuit 1
- E02 ∧ Low pressure circuit 1
- E03 ∧ Compresso overload relay 1
- E04 ∧ Fan overload relay 1
- E05 ∧ Antifreeze circuit 1
- E06 ∧ Error water outlet sensor
- E07 ∧ Error refrigerant piping sensor circuit 1
- E09 ∧ High pressure compressor 1
- E11 ∧ High pressure piping circuit 1
- E12 ∧ Low pressure piping circuit 1
- E13 ∧ Overload protection compressor 2
- E19 ∧ High pressure compressor 2
- E21 ∧ High pressure circuit 2
- E22 ∧ Low pressure circuit 2
- E23 ∧ Overload protection compressor3
- E24 ∧ Fan overload protection 2
- E25 ∧ Antifreeze protection 2
- E26 ∧ Error sensor ST5
- E27 ∧ Error refrigerant piping sensor 2
- E29 ∧ High pressure compressor 3
- E31 ∧ High piping temperature circuit 2
- E32 ∧ Low piping temperature circuit 2
- E33 ∧ Overload protection compressor 4
- E39 ∧ High pressure compressor 4
- E40 ∧ Error water inlet sensor
- E41 ∧ Error flow switch sensor
- E42 ∧ Error outdoor temperature sensor
- E43 ∧ External antifreeze
- E44 ∧ Unit without charge
- E45 ∧ Error in configuration
- E46 ∧ High inlet water temperature

Some of these units may be not available in the unit, or have slightly different meanings. See the manual of the unit to know the detailed meaning of each alarm

Example : if appear one alarm by high pressure , the parameters 9AH and 9EH will take value 2 2 (0000 0010 in binary), when the cause of the alarm is settled (pressostat restarted) , parameter 9AH will show the value 0 (0000 0000 in binary) but in the parameter 9EH nothing will change until we do not reset the alarm in the controller (pressing the reset button) .

A2H parameter (only readable)

This parameter shows the current version of the software control.

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